3 Port Solenoid Valve

VT307 Series

Direct Operated Poppet Type

[Option]

RoHS

Power consumption

4 W Standard type

(Current product: 4.8 W)

1.8 W Energy-saving type

(Current product: 2 W)

Vacuum applications

–101.2 kPa

A single valve with various valve functions

(Universal porting type)

N.C. valve	N.O. valve
Divider valve	Selector valve

etc.

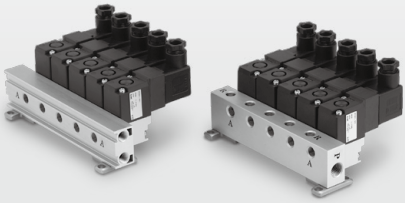
Low concentration ozone resistant

Rubber seal material: HNBR for main valve

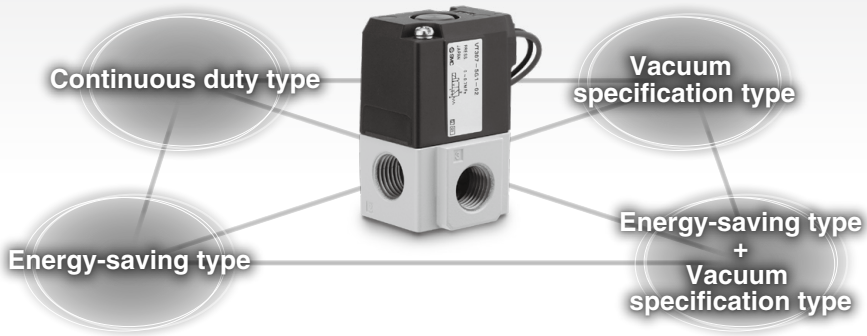
Mounting dimensions are **interchangeable** with current product

Body ported type

Manifold type

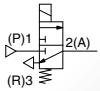


■ A variety of valve options

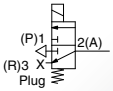


■ Application examples

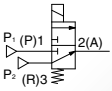
❶ Blow-off valve



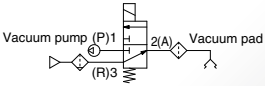
❷ Pressure release valve



❸ Selector valve

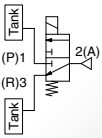


❹ Valve for vacuum

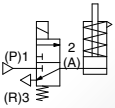


Vacuum releasing air
Atmospheric pressure or micro pressure

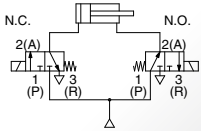
❺ Divider valve



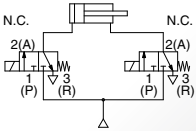
❻ Single-acting cylinder drive



❼ Double-acting cylinder drive



❽ Double-acting cylinder drive
(Exhaust center)



3 Port Solenoid Valve, Universal Porting Type Variations

Poppet type	Direct operated poppet type			Pilot poppet type
Series	 *VT307*	 *VT317*	 *VT325*	 *VP300/500/700*
Cv (P⟷A)	**0.19**	0.62	1.4	0.8 to 3.6
Page	Page 1433	Page 1441	Page 1449	Page 1261

3 Port Solenoid Valve
Direct Operated Poppet Type
VT307 Series
Rubber Seal

CE RoHS

[Option]
Note) CE compliant: Electrical entry is applicable only for the DIN terminal.

How to Order

V T 307 □ □ – 5 G □ 1 – 01 □ – F – □

Body type

T	Body ported
O	For manifold

Valve option

Nil	Standard type
E*	Continuous duty type
Y*	Energy-saving type
V*	Vacuum specification type
W*	Energy-saving type, Vacuum specification type

* Semi-standard

Pressure specifications

Nil	Standard type (0.7 MPa)
K*	High-pressure type (1 MPa)

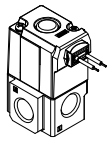
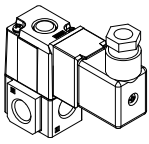
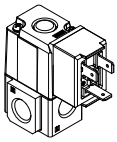
* Semi-standard

Rated voltage

Rated voltage \ Valve option		Nil	E	Y	V	W
1	100 VAC, 50/60 Hz	●	●	—	●	—
2	200 VAC, 50/60 Hz	●	●	—	●	—
3*	110 VAC, 50/60 Hz	●	●	—	●	—
4*	220 VAC, 50/60 Hz	●	●	—	●	—
5	24 VDC	●	●	●	●	●
6*	12 DCV	●	●	●	●	●
7*	240 VAC, 50/60 Hz	●	●	—	●	—

* Semi-standard

Electrical entry

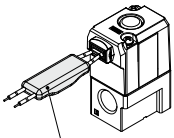
Grommet	DIN terminal
 **G**: 300 mm lead wire **H**: 600 mm lead wire	 **D**: With connector  **DO**: Without connector

Note) A gasket must be ordered separately for DO. Refer to page 1435 for gasket part numbers.

Light/Surge voltage suppressor

Nil	None
S	With surge voltage suppressor (Grommet type only)
Z	With light/surge voltage suppressor (DIN terminal type only)

With surge voltage suppressor



Port size

Nil	Without port (For manifold)
01	1/8 (6A)
02	1/4 (8A)

Thread type

Nil	Rc
F	G
N	NPT
T	NPTF

Bracket

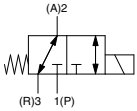
Nil	None
F	With bracket

CE-compliant

Nil	None
Q	CE-compliant*

* Electrical entry and light/surge voltage suppressor: D/DO/DZ/DOZ only

Symbol



Manifold

Model	Applicable manifold type	Accessories
VO307□(-Q)	Common or individual exhaust	Function plate (DXT152-14-1A) Note) Mounting screw (NXT013-3)

Note) It is not applicable to the continuous duty type. Refer to the accessories on page 1437.

Option

Description	Part no.
Bracket	DXT152-25-1A (With screw)

⚠Caution

Make sure that dust and/or other foreign materials do not enter the valve from the unused port (e.g. exhaust port).

Standard Specifications

Type of actuation	Direct operated type 2 position single solenoid
Fluid	Air
Operating pressure range	0 to 1 MPa (High-pressure type), 0 to 0.7 MPa (Standard type)
Ambient and fluid temperature	–10 to 50°C (No freezing)
Response time Note 1)	20 ms or less (at 0.5 MPa)
Max. operating frequency	10 Hz
Lubrication	Not required (Use turbine oil Class 1 ISO VG32, if lubricated.)
Manual override	Non-locking push type
Mounting orientation	Unrestricted
Impact/Vibration resistance Note 2)	150/50 m/s^2
Enclosure	Dustproof

Electrical entry			Grommet, DIN terminal
Coil rated voltage (V)	**AC (50/60 Hz)**		100, 200, 110*, 220*, 240*
	DC		24, 12*
Allowable voltage fluctuation			–15 to +10% of rated voltage
Apparent power Note 3) Note 4)	**AC**	**Inrush**	12.7 VA (50 Hz), 10.7 VA (60 Hz)
		Holding	7.6 VA (50 Hz), 5.4 VA (60 Hz)
Power consumption Note 3) Note 4)	**DC**		Without indicator light: 4 W, With indicator light: 4.2 W
Light/Surge voltage suppressor (DIN terminal type only)	**AC**		Varistor, LED
	DC		Diode, LED

* Semi-standard
Note 1) Based on dynamic performance test, JIS B 8419: 2010. (Coil temperature: 20°C, at rated voltage, without surge voltage suppressor)
Note 2) Impact resistance: No malfunction occurred when it is tested with a drop tester in the axial direction and at the right angles to the main valve and armature in both energized and de-energized states every once for each condition. (Values at the initial period)
Vibration resistance: No malfunction occurred in a one-sweep test between 45 and 1000 Hz. Test was performed at both energized and de-energized states in the axial direction and at the right angles to the main valve and armature. (Values at the initial period)
Note 3) At rated voltage
Note 4) The value is different for continuous duty type (VT307E), and energy-saving type (VT307Y/W). Refer to "Valve Options" shown below.

Flow Rate Characteristics/Weight

Valve model	Port size	Flow rate characteristics												Weight
		1 → 2 (P → A)			2 → 3 (A → R)			3 → 2 (R → A)			2 → 1 (A → P)			
		C[dm³/(s·bar)]	b	Cv	C[dm³/(s·bar)]	b	Cv	C[dm³/(s·bar)]	b	Cv	C[dm³/(s·bar)]	b	Cv	Grommet
VT307 **VT307V** (Vacuum spec. type) **VT307E** (Continuous duty type) **VT307Y** (Energy-saving type) **VT307W** (Energy-saving, Vacuum spec. type)	1/8	0.71	0.35	0.18	0.68	0.27	0.17	0.65	0.36	0.17	0.63	0.35	0.17	0.15 kg
		0.41	0.26	0.10	0.44	0.35	0.11	0.48	0.27	0.12	0.35	0.33	0.10	
VT307 **VT307V** (Vacuum spec. type) **VT307E** (Continuous duty type) **VT307Y** (Energy-saving type) **VT307W** (Energy-saving, Vacuum spec. type)	1/4	0.71	0.31	0.19	0.71	0.25	0.17	0.68	0.33	0.17	0.71	0.26	0.18	
		0.49	0.20	0.12	0.44	0.34	0.11	0.48	0.17	0.12	0.46	0.28	0.11	

Note) Values for a single valve unit. It is not applicable to the manifold. Refer to the manifold specifications on page 1437.

Valve Options

Continuous duty type: VT307E

Exclusive use of VT307E is recommended for continuous duty with long time loading.

⚠Caution

1. This model is for continuous duty, not for high cycle rates. But even in low cycle rates, if energizing the valve more than once a day, please consult with SMC.
2. Energizing solenoid should be done at least once in 30 days.

Specifications different from standard are as follows.

Apparent power/ AC	Inrush	7.9 VA (50 Hz), 6.2 VA (60 Hz)
	Holding	5.8 VA (50 Hz), 3.5 VA (60 Hz)
Power consumption/DC	1.8 W, With indicator light: 2 W	
Response time Note)	30 ms or less (at 0.5 MPa)	

Note) Refer to Note 1) of the standard specifications.

Energy-saving type: VT307Y (VT307W)

If low power consumption is required for electronic control, "VT307Y(W)" (1.8 W) is recommended.

Specifications different from standard are as follows.

Power consumption/DC	1.8 W, With indicator light: 2 W
Response time Note)	25 ms or less (at 0.5 MPa)

Note) Refer to Note 1) of the standard specifications.

Vacuum spec. type: VT307V (VT307W)

This vacuum model has less air leakage than the standard model under low pressure. It is recommended for vacuum application.

⚠Caution

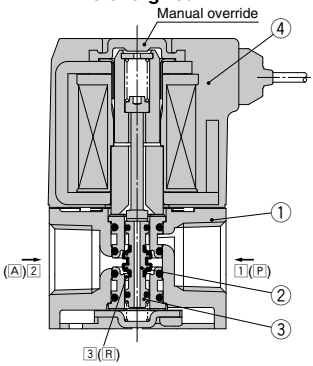
Since this valve has slight air leakage, it can not be used for vacuum holding (including positive pressure holding) in the pressure container.

Specifications different from standard are as follows.

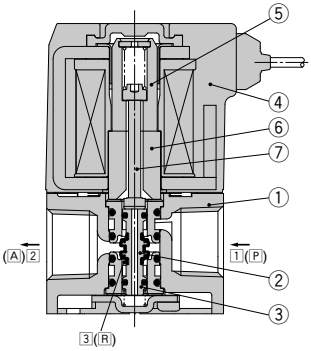
Operating pressure range	–101.2 kPa to 0.1 MPa

Construction

De-energized



Energized



Operation principle
<De-energized>
Poppet valve ② is pushed upward by the return spring ③, port 1 is closed. Then, port 2 and port 3 are connected.
Air flow direction:
Port 1 ⟷ Block, 2 ⟷ 3

<Energized>
When energizing the molded coil ④, the armature ⑤ is magnetically attracted to the core ⑥, and through the push rod ⑦, it pushes down the poppet valve ② and port 3 is closed. Then, port 1 and port 2 are connected. At this time, there will be gaps between the armature ⑤ and the core ⑥, but the armature ⑤ will be magnetically firmly attracted to the core ⑥.
Air flow direction:
Port 1 ⟷ Port 2, Port 3 ⟷ Block

Component Parts

No.	Description	Material	Note
1	**Body**	Aluminum die-casted	Color: White
2	**Poppet valve**	Aluminum, HNBR	
3	**Return spring**	Stainless steel	
4	**Molded coil**	Resin	

How to Use DIN Terminal

1. Disassembly
1) After loosening the screw ①, then if the housing ② is pulled in the direction of the screw ①, the connector will be removed from the body of equipment (solenoid, etc.).
2) Pull the screw ① out of the housing ②.
3) On the bottom part of the terminal block ③, there's a cut-off part ⑨. If a small flat head screwdriver is inserted between the opening in the bottom, terminal block ③ will be removed from the housing ②.
4) Remove the cable gland ④, plain washer ⑤ and rubber seal ⑥.

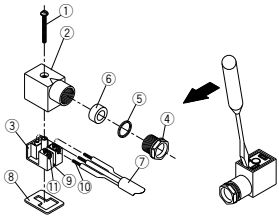
2. Wiring
1) Pass the cable ⑦ through the cable gland ④, plain washer ⑤ and rubber seal ⑥ in this order, and then insert them into the housing ②.
2) Loosen the screw ⑪ attached to the terminal block ③. Then, pass the lead wire ⑩ through the terminal block ③ and tighten the screw ⑪ again.
Note 1) Tighten within the tightening torque of 0.5 N·m ±15%.
Note 2) Cable ⑦ outside diameter: ø6 to ø8 mm (ø4.5 to ø7 mm for CE-compliant products)
Note 3) Crimped terminal like round-shape or Y-shape cannot be used.

Connector for DIN Terminal, Gasket

Description	Part no.
DIN connector	B1B09-2A (Standard)
	GM209NJ-B17 (CE-compliant)
Gasket	CAXT623-6-7-12 (Standard)
	CAXT623-6-7-11 (CE-compliant)

3. Assembly
1) Pass the cable ⑦ through the cable gland ④, plain washer ⑤ and rubber seal ⑥ in this order and connect to the terminal block ③. Then, mount the terminal block ③ on the housing ②.
(Push it down until you hear the click sound.)
2) Put the rubber seal ⑥ and plain washer ⑤ in this order into the cable entry of the housing ②, and then tighten the cable gland ④ securely.
3) Insert the gasket ⑧ between the bottom part of terminal block ③ and the plug attached to the equipment. Then, screw in ① from the top of the housing ② to tighten it.
Note 1) Tighten within the tightening torque of 0.5 N·m ±20%.

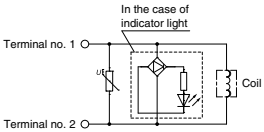
Changing the entry direction
The orientation of a connector can be changed 180°, depending on the combination of a housing ② and a terminal block ③.



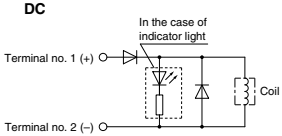
⚠Caution

Light/Surge Voltage Suppressor

AC



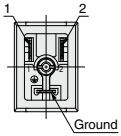
DC



Electrical Connection

DIN terminal is connected inside as in the figure below. Connect to the corresponding power supply.

DIN terminal block



Terminal no.	1	2
DIN terminal	+	–

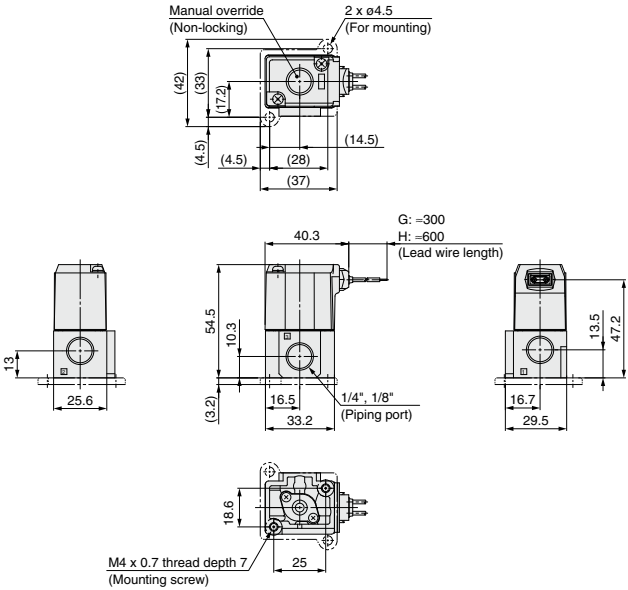
· Applicable cable O.D.
ø6 to ø8

Lead Wire Color

Voltage	Color
100 VAC	Blue
200 VAC	Red
DC	Red (+), Black (–)
Others	Gray

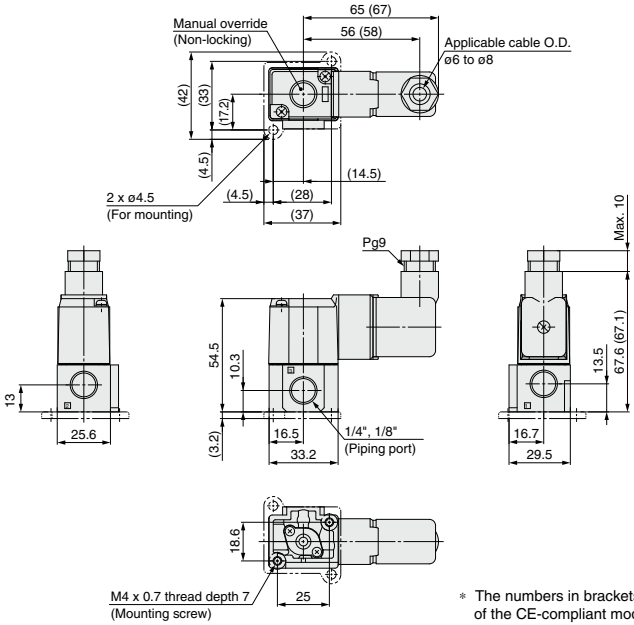
Dimensions

Grommet: VT307-□G1



Note) There is also "VT307-□H1" (lead wire length: 600 mm).

DIN terminal: VT307-□D1

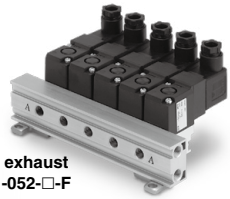


∗ The numbers in brackets indicate the dimensions of the CE-compliant model (-Q).

VT307 Series
Manifold Specifications

VT307 manifold is available both as a common exhaust and individual exhaust model.

Manifold valve can be easily converted from N.C. (Normally Closed) to N.O. (Normally Open) merely by turning over the function plate.



Common exhaust
VV307-01-052-□-F

Individual exhaust
VV307-01-053-□-F

How to Order Manifold Base

VV307 – 01 – 05 2 – 01 □ – F

Valve stations

02	2 stations
⋮	⋮
20	20 stations

Max. 20 stations

VT307 manifold
∗ Specify model number of the manifold base, applicable valves and blanking plates when ordering.
Refer to page 1433 for the model number of the valves.

Ordering example: VV307-01-052-01-F··· 1 pc.
(5 station manifolds base)
∗VO307-1G1·····4 pcs.
∗DXT060-51-13A·····1 pc.
(Blanking plate)
→ The asterisk denotes the symbol for assembly.
Prefix it to the part nos. of the solenoid valve, etc.

Exhaust port type

2	Common exhaust
3	Individual exhaust

A port size (Base mounted)

01	1/8 common exhaust/individual exhaust
02	1/4 individual exhaust

Thread type

Nil	Rc
F	G
N	NPT
T	NPTF

Mounting bracket

Manifold Specifications

Manifold type	B mount
Max. number of stations	20 stations Note)
Applicable solenoid valve	VO307□-□□□□ (-Q)

Exhaust port		Port location (Direction)/Port size		
Symbol	Type	P	A	R
2	Common	Base (Side) 1/8	Base (Side) 1/8	Base (Side) 1/8
3	Individual	Base (Side) 1/4	Base (Side) 1/8, 1/4	Base (Top) 1/8

Note) For 6 stations or more, supply air both sides of P port. The common exhaust type should exhaust from both of the R port.

Option

Description	Part no.
Blanking plate (With gasket, screw) Note)	DXT060-51-13 A/B

Accessories for Applicable Solenoid Valve

Description	Part no.	Qty.
Function plate (With gasket) Note)	DXT152-14-1 A/B	1 pc.
Mounting screws	NXT013-3	2 pcs.

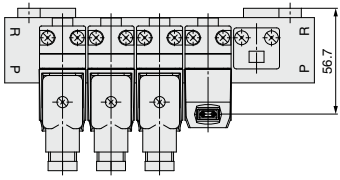
Note) DXT060-51-13B, DXT152-14-1B are for the continuous duty type.

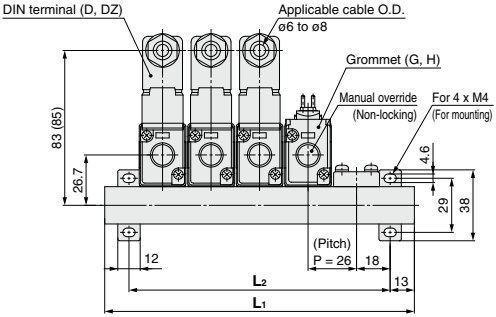
Flow Rate Characteristics/Weight

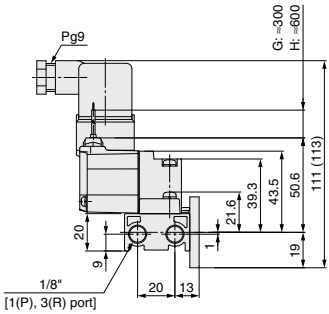
Valve model	Flow rate characteristics												Weight
	1 → 2 (P → A)			2 → 3 (A → R)			3 → 2 (R → A)			2 → 1 (A → P)			
	C[dm³/(s·bar)]	b	Cv	C[dm³/(s·bar)]	b	Cv	C[dm³/(s·bar)]	b	Cv	C[dm³/(s·bar)]	b	Cv	Grommet
VO307	0.34	0.28	0.089	0.34	0.22	0.082	0.36	0.28	0.091	0.34	0.18	0.080	0.15 kg
VO307V (Vacuum spec. type)													
VO307E (Continuous duty type)	0.30	0.18	0.070	0.30	0.15	0.072	0.32	0.20	0.075	0.30	0.15	0.069	
VO307Y (Energy-saving type)													
VO307W (Energy-saving, Vacuum spec. type)													

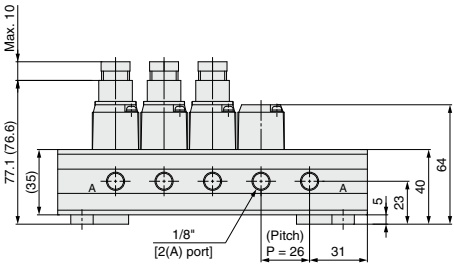
Dimensions: Common Exhaust

VV307-01-□2-01-F









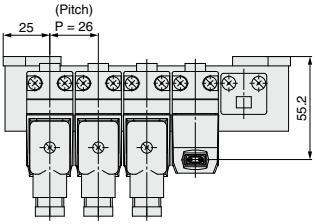
L Dimension n: Stations

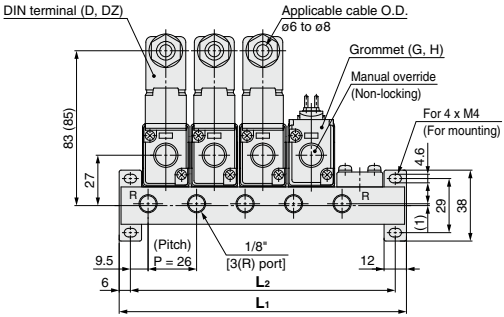
L \ n	2	3	4	5	6	7	8	9	10	Formula
L_1	88	114	140	166	192	218	244	270	296	$L_1 = 26 \times n + 36$
L_2	62	88	114	140	166	192	218	244	270	$L_2 = 26 \times n + 10$

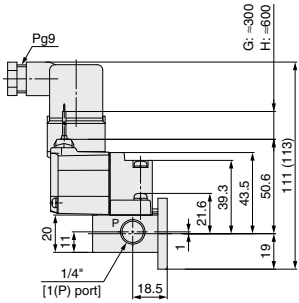
∗ The numbers in brackets indicate the dimensions of the CE-compliant model (-Q).

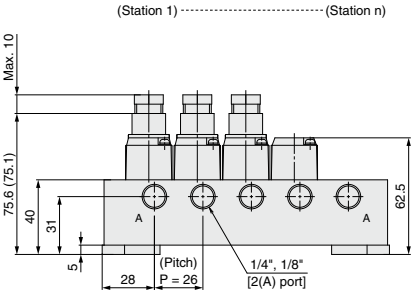
Dimensions: Individual Exhaust

VV307-01-□3-□-F









L Dimension

n: Stations

L \ n	2	3	4	5	6	7	8	9	10	Formula
L_1	76	102	128	154	180	206	232	258	284	$L_1 = 26 \times n + 24$
L_2	64	90	116	142	168	194	220	246	272	$L_2 = 26 \times n + 12$

∗ The numbers in brackets indicate the dimensions of the CE-compliant model (-Q).

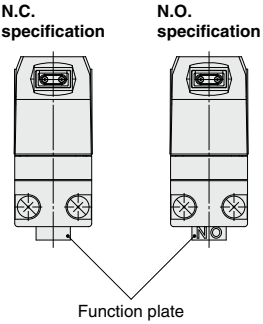
Specific Product Precautions

Be sure to read this before handling the products. Refer to back page 50 for Safety Instructions and pages 3 to 9 for 3/4/5 Port Solenoid Valve Precautions.

Mounting

⚠Warning

When mounting a valve on the manifold base, N.C. and N.O. can be reversed by the function plate orientation. Also, since the cylinder operates in reverse, confirm if the function plate is correctly mounted or not.



⚠Caution

1. Each valve is fixed to the manifold base with two M4 mounting screws. Tighten the screws firmly when re-mounting.
2. For mounting, tighten M4 or equivalent screws evenly into the mounting holes of the manifold base.
   Tightening torque of the mounting screw (M4): 1.4 N·m

Changing from N.C. to N.O.

⚠Caution

This product is delivered as N.C. valve.
If N.O. valve is required, remove mounting screws of the required valve and turn over the function plate. (Make sure that there are gaskets on both sides of the plate.) Then, tighten the mounting screws to fix the valve to the manifold base.

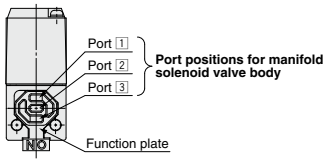


Figure: For N.C.

Specifications	Function plate
N.C.	No mark
N.O.	NO

Piping

⚠Caution

1. For the common exhaust type, pressurization or evacuation of the 3(R) port can cause a malfunction.